

## CLAIMS

What is claimed is:

1. A photomultiplier tube comprising:

5        a cathode (3) emitting electrons in response to  
incident light;

      a plurality of dynodes (107) multiplying electrons  
emitted from the cathode; and

      potential regulating means (115, 215, 315, 319, 323)  
10    disposed in a prescribed position in relation to an edge of  
a first dynode (107a) positioned in a first stage from the  
cathode and an edge of a second dynode (107b) positioned in  
a second stage from the cathode, and smoothing an  
equipotential surface in a space between the first dynode  
15    (107a) and the second dynode along a longitudinal direction  
of the first dynode (107a).

      2. The photomultiplier tube as claimed in Claim 1,  
wherein the potential regulating means is a plate-shaped  
electron lens forming electrode (115, 215, 315, 323)  
20    disposed between the edge of the first dynode (107a) and the  
edge of the second dynode (107b) and arranged substantially  
parallel to a side wall of the first dynode (107a) and  
separated from the first dynode (107a); and

      a voltage is applied to the electron lens forming  
25    electrode (115, 215, 315, 323) to produce a higher potential

than the potential of the first dynode (107a).

3. The photomultiplier tube as claimed in Claim 2, wherein the electron lens forming electrode (115, 215) is electrically connected to an edge of a third dynode (107c) positioned in a third stage from the cathode.

4. The photomultiplier tube as claimed in Claim 2, wherein the electron lens forming electrode (315, 323) is separated from the plurality of dynodes (107).

5. The photomultiplier tube as claimed in any of Claims 2 through 4, further comprising a second electron lens forming electrode (115, 215, 319) disposed between an edge of the second dynode (107b) and an edge of the third dynode (107c) and arranged substantially parallel to the electron lens forming electrode (115, 215, 315) and separated from the second dynode; and

wherein a voltage is applied to the second electron lens forming electrode (115, 215, 319) to produce a higher potential than the potential in the second dynode (107b).

6. The photomultiplier tube as claimed in Claim 5, wherein the second electron lens forming electrode (115, 215) is integrally formed with the electron lens forming electrode (115, 215).

7. The photomultiplier tube as claimed in any of Claims 2 through 6, wherein the cathode (3), the dynodes (107), and the lens forming electrode (115, 215, 315, 319,

323) are disposed in a hermetically sealed vessel (1) that is cylindrical in shape and sealed on both ends;

the light enters the hermetically sealed vessel (1) from one end thereof;

5           the dynodes (107) are concave and substantially arc-shaped, the first dynode (107a) opening substantially toward the one end of the hermetically sealed vessel (1), the second dynode (107b) opening substantially toward another end of the hermetically sealed vessel (1), and the third  
10       dynode (107c) opening substantially toward the one end of the hermetically sealed vessel (1), and the electrons impinge on and are emitted from inner surfaces of the dynodes (107); and

          the lens forming electrode (115, 215, 315, 323) forms  
15       a fan shape that follows the concave shape of the first dynode (107a) when viewed in a cross section along a direction orthogonal to the inner surfaces of the first dynode (107a), second dynode (107b), and third dynode (107c).